

U.S. Application No. 09/455,363

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

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Listing of Claims:

1. - 25. (Canceled).

26. (Currently amended) A network relaying method for a communication network system in which a plurality of network devices are coupled via a communication path, each network device including a network relaying device which is coupled via a plurality of I/O ports to a corresponding plurality of terminals, the method comprising the steps of:

receiving a packet at a first I/O port from a source terminal coupled to the first I/O port, the packet including a header containing a packet transmission source address;

determining whether a first combination of information contained in the received packet ~~the first I/O port and the packet transmission source address~~ coincides sufficiently with a second combination of an I/O port and a transmission source address ~~that have information that has been registered in advance with a correspondence therebetween;~~ wherein said first combination of information includes the first I/O port and the packet transmission source address of the received packet and said second combination of information includes an I/O port and a transmission source address that have been registered in advance with a correspondence therebetween, and, in response to when the determining step results resulting in a determination that the first

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~~combination of information of the first I/O port and the packet transmission source address coincides sufficiently with a the second combination of information of an I/O port and transmission source address that have been registered in advance with a correspondence therebetween, transferring the packet received at the first I/O port via a second I/O port, wherein said first combination of information coincides sufficiently with said second combination of information for said relay portion to transfer the received packet from the second I/O port when said first I/O port and said packet transmission source address coincide with said I/O port and transmission source address that have been registered in advance with a correspondence therebetween;~~

~~when in response to the determining step results resulting in a determination that the first combination of information of the first I/O port and the packet transmission source address does not have a coincidence coincide sufficiently with a the second combination of information of an I/O port and transmission source address that have been registered in advance with a correspondence therebetween:~~

limiting transfer of the received packet and transmitting a request for user authentication of a user to the source terminal of said received packet;

receiving user authentication information sent from the source terminal in response to the request for user authentication;

executing user authentication of the user based on the user authentication information thus received and based on the packet transmission source address;

when the user is authenticated by the user authentication executed in the executing step, registering the first I/O port with a correspondence to the packet transmission source address;

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transferring the packet received at the first I/O port via the second I/O port; and
when the user is not authenticated by the user authentication executed in the
executing step, not transferring the packet received at the first I/O port.

27. (Previously presented) A network relaying method according to Claim 26,
wherein the user authentication information includes a user name and a password.

28. (Previously presented) A network relaying method according to Claim 26,
wherein the transmission source address includes an IP address and a MAC address.

29. (Currently amended) A network relaying apparatus, comprising:
a plurality of I/O ports adapted to be coupled to a plurality of terminals,
respectively;
a communication portion for transmitting and receiving data via the plurality of I/O
ports;
a relay portion which determines a transmitting I/O port of the plurality of I/O
ports, from which a packet received via the communication portion from a receiving I/O
port of the plurality of I/O ports is output via the communication portion; and which
determines whether a first combination of information contained in the received packet
~~the receiving I/O port and a packet transmission source address contained in the packet~~
coincides sufficiently with a second combination of an I/O port and a transmission
~~source address that have~~ information that has been registered in advance with a
~~correspondence therebetween, wherein said first combination of information includes~~

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the receiving I/O port and a packet transmission source address of the received packet and said second combination of information includes an I/O port and a transmission source address that have been registered in advance with a correspondence therebetween, wherein said relay portion transfers the received packet from the transmitting I/O port when in response to the relay portion determines determining that the first combination of information of the receiving I/O port and the packet transmission source address coincides sufficiently with a the second combination of information of an I/O port and transmission source address that have been registered in advance with a correspondence therebetween, wherein said first combination of information coincides sufficiently with said second combination of information for said relay portion to transfer the received packet from the transmitting I/O port when said receiving I/O port and said packet transmission source address coincide with said I/O port and transmission source address that have been registered in advance with a correspondence therebetween, and wherein said relay portion requests user authentication of a user from a source terminal of said received packet when in response to the relay portion determines determining that the first combination of information of the receiving I/O port and the packet transmission source address does not have a coincidence coincide sufficiently with a the second combination of information of an I/O port and a transmission source address that have been registered in advance with a correspondence therebetween;

an authentication portion which registers the receiving I/O port with a correspondence to the packet transmission source address when completing user authentication based on user authentication information sent from the source terminal in

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response to the request for user authentication and based on the packet transmission source address, and

wherein when the authentication portion does not authenticate the user, the relay portion does not transfer the received packet.

30. (Previously presented) A network relaying apparatus according to Claim 29, wherein the user authentication information includes a user name and a password.

31. (Previously presented) A network relaying apparatus according to Claim 29, wherein the transmission source address includes an IP address and a MAC address.

32. (Currently amended) ~~The~~ A network relaying method according to claim 26, for a communication network system in which a plurality of network devices are coupled via a communication path, each network device including a network relaying device which is coupled via a plurality of I/O ports to a corresponding plurality of terminals, the method comprising the steps of:

receiving a packet at a first I/O port from a source terminal coupled to the first I/O port, the packet including a header containing a packet transmission source address;

determining whether a combination of the first I/O port and the packet transmission source address coincides with a combination of an I/O port and a transmission source address that have been registered in advance with a correspondence therebetween;

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when the determining step results in a determination that the combination of the first I/O port and the packet transmission source address coincides with a combination of an I/O port and transmission source address that have been registered in advance with a correspondence therebetween, transferring the packet received at the first I/O port via a second I/O port;

when the determining step results in a determination that the combination of the first I/O port and the packet transmission source address do not have a coincidence with a combination of an I/O port and transmission source address that have been registered in advance with a correspondence therebetween;

limiting transfer of the received packet and transmitting a request for user authentication of a user to the source terminal of said received packet;

receiving user authentication information sent from the source terminal in response to the request for user authentication;

executing user authentication of the user based on the user authentication information thus received and based on the packet transmission source address;

when the user is authenticated by the user authentication executed in the executing step, registering the first I/O port with a correspondence to the packet transmission source address;

transferring the packet received at the first I/O port via the second I/O port; and

when the user is not authenticated by the user authentication executed in the executing step, not transferring the packet received at the first I/O port;

wherein the source terminal coupled to the first I/O port belongs to a VLAN; and

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wherein when a user is not authenticated by the user authentication executed in the executing step, a warning message is sent to all terminals belonging to the same VLAN as the source terminal of the packet received at the first I/O port.

33. (Previously presented) The network relaying method according to claim 26, further comprising the step of performing user authentication periodically for each of said plurality of terminals having an address registered in advance with a correspondence to an I/O port.

34. (Previously presented) The network relaying method according to claim 26, wherein the received packet includes a destination address, and the method further comprises the steps of:

determining whether the destination address is registered in advance as a source address in combination with an I/O port;

if the determining step determines that the destination address of the received packet is not registered in advance as a source address in combination with an I/O port, user authentication is made as to a destination terminal having the destination address, by transmitting a request for user authentication to the destination terminal of the received packet; receiving user authentication information sent from the destination terminal in response to the request for user authentication based on the user authentication information thus received from the destination terminal; when the user is authenticated by the user authentication based on the user authentication information received from the destination terminal, registering the first I/O port with a

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correspondence to the destination address; and when the user is not authenticated by the user authentication based on the user authentication information received from the destination terminal, not registering the first I/O port with a correspondence to the destination address.

35. (Currently amended) ~~The~~ A network relaying apparatus according to claim 29, comprising:

a plurality of I/O ports adapted to be coupled to a plurality of terminals,

respectively:

a communication portion for transmitting and receiving data via the plurality of I/O ports;

a relay portion which determines a transmitting I/O port of the plurality of I/O ports, from which a packet received via the communication portion from a receiving I/O port of the plurality of I/O ports is output via the communication portion; and which determines whether a combination of the receiving I/O port and a packet transmission source address contained in the packet coincides with a combination of an I/O port and a transmission source address that have been registered in advance with a correspondence therebetween, wherein said relay portion transfers the received packet from the transmitting I/O port when the relay portion determines that the combination of the receiving I/O port and the packet transmission source address coincides with a combination of an I/O port and transmission source address that have been registered in advance with a correspondence therebetween, and wherein said relay portion requests user authentication of a user from a source terminal of said received packet

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when the relay portion determines that the combination of the receiving I/O port and the packet transmission source address do not have a coincidence with a combination of an I/O port and a transmission source address that have been registered in advance with a correspondence therebetween;

an authentication portion which registers the receiving I/O port with a correspondence to the packet transmission source address when completing user authentication based on user authentication information sent from the source terminal in response to the request for user authentication,

wherein when the authentication portion does not authenticate the user, the relay portion does not transfer the received packet,

wherein the source terminal of the received packet belongs to a VLAN; and

wherein when a user is not authenticated by the user authentication, a warning message is sent to all terminals belonging to the same VLAN as the source terminal of the received packet.

36. (Previously presented) The network relaying apparatus according to claim 29, wherein user authentication is performed periodically for each terminal having an address registered in advance with a correspondence to an I/O port.

37. (Previously presented) The network relaying method according to claim 29, wherein the received packet includes a destination address,
wherein the relay portion determines whether the destination address is registered in advance as a source address in combination with an I/O port,

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wherein if the relay portion determines that the destination address of the received packet is not registered in advance as a source address in combination with an I/O port, the relay portion initiates user authentication as to a destination terminal having the destination address by transmitting a request for user authentication to the destination terminal of the received packet and receiving user authentication information sent from the destination terminal in response to the request for user authentication based on the user authentication information thus received from the destination terminal,

wherein when the user is authenticated by the user authentication based on the user authentication information received from the destination terminal, the authentication portion registers the receiving I/O port with a correspondence to the destination address, and

wherein when the user is not authenticated by the user authentication based on the user authentication information received from the destination terminal, the authentication portion does not register the receiving I/O port with a correspondence to the destination address.